FILED

IN THE

Supreme Court of the United States

OCTOBER TERM, 1934.

Nos. 255 and 256

ALTOONA PUBLIX THEATRES, INC.,

Petitioner,

and

WILMER & VINCENT CORPORATION and LOCUST STREET REAL ESTATE COMPANY,

Petitioners,

vs.

AMERICAN TRI-ERGON CORPORATION and TRI-ERGON HOLDING, A. G.,

Respondents.

APPENDIX TO PETITIONERS' BRIEF

ITEM I.

Analysis of the Claims in Suit as Issued in the Patent on May 21, 1929, and Statement of the Amendments Later Made Therein by Respondents' Disclaimer of May 31, 1933.

THE FLYWHEEL CLAIMS.

Claim 5.

As Issued:

"In phonographic apparatus in which the sound record is formed on an elongated ribbon of inconsiderable mass, having feeding perforations therein, the combination of

(a) means for supporting and progressing the record ribbon from one point to another point and past an intermediate point at which the record is made on the ribbon in recording or from which the record is taken from the ribbon in reproducing, including

(1) a toothed cylinder over a portion of which the ribbon passes adjacent to said intermediate point, the teeth of said cylinder engaging the perforations of the ribbon,

(2) a flywheel associated with said cylinder, and

(3) means for rotating said cylinder, under control of said flywheel at uniform speed."

As Amended by the Disclaimer:

This claim is amended by the disclaimer as follows:

By substituting for "phonographic apparatus in which the sound record is formed on an elongated ribbon of inconsiderable mass," at the beginning of the claim, the following:

"apparatus wherein sound is translated by light to or from a film strip moving uniformly past said light."

Claim 7.

As Issued:

"In phonographic apparatus in which the sound record is formed of an elongated carrier of inconsiderable mass, the combination of

(a) means for supporting and progressing the elongated carrier from one point to another point, and past an intermediate point at which the record is made on the carrier in recording or from which the record is taken from the carrier in reproducing, including

(1) a cylinder over a portion of the periphery of which the carrier passes adjacent to said intermediate point,

(2) a flywheel,

(3) a shaft on which said cylinder and flywheel are both secured,

(4) a driving member coaxial with said shaft,

(5) a resilient connection between said driving member and flywheel,

(6) and stop means for limiting the amount of yielding of said resilient connection."

As Amended by the Disclaimer:

This claim is amended by the disclaimer as follows:

By substituting for "phonographic apparatus in which the sound record is formed on an elongated carrier of inconsiderable mass," at the beginning of the claim, the following:

"apparatus wherein sound is translated by light to or from a film strip moving uniformly past said light."

Claim 17.

As Issued:

"In phonographic apparatus in which the sound record is formed on an elongated carrier of inconsiderable mass, the combination of

(a) means for supporting and progressing the elongated carrier from one point to another point, and past an intermediate point at which the record is made on the carrier in recording or from which the record is taken from the carrier in reproducing, including

(1) a cylinder over a portion of the periphery of which the carrier passes adjacent to said intermediate point,

(2) a flywheel operatively associated with said cylinder,

(3) said carrier progressing means operating to advance the carrier past said intermediate point at uniform speed under the control of said flywheel".

As Amended by the Disclaimer:

This claim is amended by the disclaimer as follows:

By substituting for "phonographic apparatus in which the sound record is formed on an elongated carrier of inconsiderable mass," at the beginning of the claim, the following:

"apparatus wherein sound is translated by light to or from a film strip moving uniformly past said light."

By adding the following two new elements:

1. a sprocket engaging the film forms a part of the film progressing means.

2. a substantial portion of the periphery of the cylinder is in contact with the film in its travel from the intermediate point to said sprocket.

Claim 18.

As Issued:

"The method of translating sound or similar vibrations to or from a film record by the use of light varied in accordance with the sound, comprising

(a) rapidly advancing the film past the point of translation, and

(b) subjecting the motion of the film in passing said point, to the control of inertia means to effectively eliminate irregularities in the movement of the film".

As Amended by the Disclaimer:

This claim is amended by the disclaimer by adding as an additional step:

the inertia control is effected by passing the film over a rotating member and so applying inertia thereto as to eliminate substantially all irregularities in its rotation.

Claim 19.

As Issued Incorporating the Steps of Claim 18:

"The method of translating sound or similar vibrations to or from a film record by the use of light varied in accordance with the sound, comprising

(a) rapidly advancing the film past the point of translation, and

(b) subjecting the motion of the film in passing said point, to the control of inertia means to effectively eliminate irregularities in the movement of the film.

(c) the film is yieldingly pressed into contact with a supporting area immediately adjacent the point of translation, such pressure cooperating with the inertial control in the elimination of irregularities in the film motion."

As Amended by the Disclaimer:

This claim is amended by the disclaimer by adding as an additional step:

the inertia control is effected by passing the film over a rotating member and so applying inertia thereto as to eliminate substantially all irregularities in its rotation.

THE ARCUATE FLEXING CLAIM.

Claim 9.

As Issued:

"The method of translating sound or similar vibrations to or from a film record by the use of light varied in accordance with the sound which comprises

(a) flexing the film arcuately longitudinally at the point of translation and

(b) rapidly and uniformly moving the film in a circumferential direction past said point."

As Amended by the Disclaimer:

This claim is amended by the disclaimer by adding as an additional step:

the uniformity of movement of the film past the translating point is effected by subjecting the portion of the film passing said point to the control of the inertia of a rotating weighty mass [flywheel].

THE OPTICAL CLAIM.

Claim 13.

As Issued:

"An apparatus for reproducing speech, music or the like sounds from vibrations recorded on a film, by the use of a line of light varied in accordance with the sound, comprising

(a) a photoelectric cell,

(b) means for imparting to the film a rapid and uniform motion longitudinally of the film past said cell,

(c) a source of light projection for providing said light, and

(d) an objective lens in the path of said light and spaced from the film for directing said light as a converging narrow line impinging on the film at a point in the region of the focal point of said lens, said light passing through the film and on to said cell, the space between said lens and the film being free of obstructions to said light."

As Amended by the Disclaimer:

This claim is amended by disclaimer by adding the following new element:

a flywheel operatively connected with the film through means which imparts uniformity of motion of the flywheel to the film.

ITEM II.

Specification and Claims of the Application for the Patent in Suit as Originally Filed in the United States Patent Office on March 20, 1922 (Vol. III, pp. 15-21).

TO ALL WHOM IT MAY CONCERN:

Be it known that we, HANS VOGT, JOSEPH MASSOLLE and JOSEF ENGL, citizens of the German Republic, and residents respectively the first of Berlin-Wilmersdorf, the second and third of Berlin-Grunewald, Germany, have invented a new and improved

DEVICE FOR PHONOGRAPHS WITH LINEAR PHONOGRAM CARRIERS

of which the following is a full, clear and exact description.

The recording and the reproduction of sound waves by the use of linear phonogram carriers such as film strips, steel wires, and so forth, can only then be effected in absolutely satisfactory manner, even after the removal of all other occurring difficulties, when the speed of the tone carrier is uniform both for the receiving and the reproduction, and when in both cases no variations of any kind occur. Especially in the case of musical reproductions is the record extremely sensitive to the slightest variations of speed. Consequently, it has hitherto been usual to provide apparatuses such as phonographs and gramophones with speed regulators. In these apparatuses, however, the problem of the uniform motion does not assume the same importance as in the case of phonographs with linear phonogram carriers, because with the former the tone

carrier consists of a roller or disc possessing a somewhat considerable mass momentum which equalizes any small irregularities in the motion, such as may be caused, for instance, by the driving mechanism. In the latter case, however, that of phonographs with linear records, the operation of the record which is in action at a given moment possesses practically no momentum to be taken into consideration. Irregularities in the motion, such, for instance, as may be caused by the projections, the teeth, the belts, the connecting places, and so forth, or by the friction at the guiding point (the slot, the magnet, the condenser), become consequently very much more important with these and thus impair the periodicity of the sound recorded by considerable amounts.

According to the present invention, this drawback which attaches to all hitherto known propulsion mechanisms for linear phonogram records is obviated by the arrangement, that the light tone record has given to it at the controlling point the property of a weighty mass. This is attained by the arrangement that the support (a film strip or the like) is firmly pressed against one or more rollers connecting with a heavy rotating mass, so that the record moves in exact conformity with the rollers and the rotating mass.

Constructional examples of the invention are illustrated in the Figures.

The phonogram carrier, which in these illustrations is shown as a film strip, moves over the rollers r', r^2, suitably coupled by gearing or belting, of which rollers preferably the roller directly driven by the motor is provided with toothing. One or even both rollers are rigidly connected with the rotating masses m', m^2, which give to the film strip f travelling between them under tension the requisite uniformity of its motion. Between the rollers r', r^2, there is placed preferably in a sleeve h the part z sensitive to electric light, which is influenced by a light

ray passing out of *o* and over the film. The rollers *dr'*, *dr²*, press the film against the carrier roller *r²*.

Another construction of the invention in which the little irregularities often caused by the teeth or the film strips between *r'*, *r²*, easily brought into mechanical oscillations, are avoided. This is shown in Figure 2.

The film *f* is drawn by the roller *r'* to the controlling point *s* and is removed from the controlling point by the roller *r²*. Between these transporting rollers, the film is guided over the periphery of a larger roller R on which it rests closely by adhesion, even during the turning motion. As the roller is rigidly connected with the rotating mass *m*, or can be constructed so as to be itself the rotating mass, the film moves uniformly on in like manner as the surface of the roller R. For the purpose of pressing the film upon the roller R, and for the equalizing of irregularities of motion, there are provided the spring-supported rollers *dr'*, *dr²*. The light rays required for the illumination or the transmission of light through the film are thrown upon the film in the form of a narrow line by means of the objective *o*. On the reproduction the light rays pass through the film strip and fall upon the photo cell *z* preferably placed in its interior. For this purpose, the roller is either partially transparent, made of glass, or the part of the film bearing the tone indications projects beyond the non-transparent parts of the roller.

In the hereinbefore described form of execution of the invention the driving of the tone band is however not effected directly at the point of projection but in front or behind the same. The driving point of the tone band can however, in further development of the invention, be arranged directly at the point of projection. The driving member can, in this case, be constructed in such a manner that the coming in gear and the getting out of gear of the feeding teeth in the perforations remains without

reaction on the speed of the film band at the point of projection.

Fig. 3 shows this form of construction by way of example. The shaft *a* journalled at *b* and *c*, carries at one end the feed-cylinder *d* which has as usual teeth designed to engage with the perforations of the tone-band. The film *g* is in contact with one part of the circumference of this cylinder, the length of this part corresponding with the distance between the pressing pulleys *e* and *f*. The driving disk *h'* for which a toothed wheel or any other convenient means can be substituted, and further the fly wheel *i*, are keyed upon this shaft and designed to communicate to the shaft and consequently to the cylinder *d*, a uniform revolving speed. The tone band will consequently move also with uniform speed, for instance in the direction *f-e*. These pulleys *e-f* press the band strongly against the cylinder *d* so that it is securely guided upon the entire length from *f* to *e* owing to the feeding teeth engaging with the perforations. The throwing in gear and out of gear of the feeding teeth is effected by the pressure of the pulleys *f* and *e* so that vibrations of the film band at the point of projection do no longer occur. The free ends *g-g* of the film band are preferably guided by the rollers for preliminary winding up in the manner well known from cinematography so that they form a loop. For recording purposes, if the rythmically controlled light which has to be recorded needs expose the tone band only upon the coated surface, a solid cylinder *d* can be used, upon which the film band bears with its entire width.

For reproducing purposes, when the light, collected by the object-glass *n* to a narrow line coming from the source of light-projection traverses the film in order to get a light-sensitive element, for instance the cell *k* with the cathode *l* and anode *m*, a specially constructed cylinder is required, *d* on figure 3 shows a form of construction by way of example in which the part of the band which

carries the tone-signs projects over the edge of the cylinder. The tone signs can be utilised also between the two rows of perforations, as only one row of perforations is used for conveying, the other side of the tone band moving along either without a special guiding or with the aid of a wheel with or without feeding teeth, which is specially driven, or not.

If the driving shaft of the tone-film revolves merely with a low number of revolutions and if a rigid drive is used, the circumferential speed of fly wheels which can be practically still utilised, will, under certain conditions, not be sufficient for compensating the speed fluctuations.

According to the invention the driving of the fly wheel axle is therefore effected with the aid of an elastic coupling, for instance a spring. This spring can be very feeble as, at constant speed, it has to overcome only the losses from friction of the driving part. As however, at the starting and running out of the driving gear, the inertia of the fly wheel has to be overcome, it is advantageous to limit the play of the spring in either direction by a fixed stop.

We claim:—

1.—An arrangement for phonography with linear phonogram carrier characterized in that constant speed is imparted to the phonogram carrier at the point of recording or at the governing point by means of a heavy mass moving with the same, in providing the recording—or governing point (s) of the phonogram carrier (f) between the two cylinders (r' and r^2) (fig. 1) having each a fly wheel (m' or m^2), if a cylinder (R) with fly wheel (m) is used, upon the circumference (fig. 2).

2.—A driving device for tone bands as claimed in claim 1 characterized in that the toothed cylinders which feed the tone band act directly at the projection-point of the tone band.

3.—A driving device as claimed in claim 2 characterized in that, for reproducing purposes, the part of the film bands which carries the tone-records projects over the edge of the toothed cylinder so that the bundle of light-rays can get without impedement to the light-elecric element.

4.—Drive for tone films as claimed in claim 1 or 2 characterized by a drive with electric [elastic] coupling.

5.—Form of construction of the drive as claimed in claim 4 characterized by the limiting of the coupling (spring) at either side by fixed stops.

ITEM III.

German Nullity Decision *re* Flexible Coupling for Flywheels.

In the Patent Litigation

of

Electrical Research Products Inc., of New York,
Plaintiff,

versus

Tri-Ergon Holding A. G. of St. Gall, Switzerland,
Defendant,

and the Tonbild-Syndikat Aktiengesellschaft of Berlin,
Sub-Intervenor,

relating to the declaration of nullity of Patent 389,317, the Patent Office, Nullity Department, in its sitting of March 13, 1930, in which there participated:

Chief Government Advisor Brisken
as chairman and the
Government Advisors:

Richter,
Dr. E. Schmidt,
Dr. Forch,
Habermann

has decided after an oral hearing:

"Patent 389,317 is declared null and void. The costs of the invention are to be borne by the intervenor and the remaining costs of the proceedings by the defendant."

FACT SITUATION.

Defendant is the owner of Patent 389,317, a patent of addition to Patent 387,058 "Arrangement for Phonographs with linear Record Carriers particularly for the Purposes of Talking Pictures", effective as of January 24, 1922, whose grant was published on December 20, 1923. The patent claims are as follows:

1.) "Arrangement for Phonographs with linear record carriers, particularly for the purpose of talking films according to Patent 387,058, characterized in this, that the drive of the fly wheel axis is effected by means of an elastic coupling.

2.) Arrangement according to claim 1, characterized in this, that the play of the coupling formed by the spring is limited by fixed stops."

On December 10, 1928 plaintiff requested that Patent 389,317 be declared null and void in its entire extent. In substantiation plaintiff sets forth that the subject matter of the patent was no longer novel at the time of the application and to prove this a number of patent specifications are set forth merely by number.

Plaintiff particularly stresses the fact that the application which is now Patent 389,317 was not examined with sufficient thoroughness in the plaintiff's opinion. British Patent 125,887 was cited as the only prior publication in the examination proceedings.

According to the subject matter of the main claim of the patent under attack the driving of the axis of the rotating mass takes place by means of an elastic coupling. At lines 22-24 of page 1 of the description it is admitted that the use of flexible couplings between two axis was known for gramophones. Further on in the description it is stated that such a coupling would not be sufficient to prevent the transmission of shock-like speed variations from the driving axis to the driven axis and that the latter must possess

accumulated energy which in the present case is the rotating mass affixed to the driven axis. An arrangement in which the drive of an axis carrying a rotating mass takes place by means of an elastic coupling, is described in U. S. Patent 1,221,407 in which the driving shaft of a phonograph sound recording apparatus provided with a rotating mass is connected with the driving shaft of a cinematograph. In the U. S. Patent the elastic coupling does not consist of a spring but the patent under attack does not only claim springs but also elastic couplings of all kinds. Spring couplings were generally known as follows from British Patent 15,333 of 1912. This patent also anticipates claim 2, as also in this case the movement enabled by the spring is limited by fixed stops.

French Patent 472,467 also discloses the use of an elastic drive for an axis carrying a fly wheel, driving a linear record carrier. The driving belt placed over the rotating mass itself constitutes the elastic coupling. British Patent 166,321 also discloses a similar elastic drive. Even though the latter two patents do not expressly contain the statement that the arrangements described therein may be used for the purpose of the talking film, this is a matter of course for the worker in the art especially, if British Patent 115,942 is taken into consideration at the same time.

In addition, the plaintiff refers to German Patent 185,532, U. S. Patent 1,255,143 and 1,312,103 as well as to French Patent 492,564 which also describe flexible couplings or drives.

The defendant requests that the filed nullity complaint be dismissed and that the plaintiff pay the costs of the proceeding. Right from the beginning the nullity complaint was inadmissible; the plaintiff had not observed the period of Section 28, paragraph 3 of the Patent Law. In this respect reference is had to the statements of the defendant's petition of May 8, 1929 in the nullity complaint filed against the main patent.

The defendant states that none of the patent specifications cited by the plaintiff, except British Patent 115,942

refer to a linear sound record carrier. Apparently the plaintiff does not seriously wish to cite British Patent 115,942 as prior publication of the patent under attack. It only wishes to simultaneously consider this patent with the contents of British Patent 166,321 and French Patent 472,467. But such a combination of the contents of three patents is inadmissible. Even when combining the contents of these three patents which would not result in a device shown in any of the three patents, the device so resulting would not incorporate the invention forming the basis of the patent under attack. Even what may be considered the flexible coupling of British Patent 166,321 does not answer the purpose which is suggested by the arrangement according to the patent under attack. A belt driving the recording apparatus of a phonograph as in French Patent 472,467, cannot serve as a flexible coupling in the sense of the invention forming the basis of the patent under attack. Likewise the coupling of a gramophone to a cinematograph as shown in U. S. Patent 1,255,143 does not appear to be anticipatory as in this case the driving of the gramophone is to be instantaneously effected from the position of rest and the shocks resulting in the operation are to be kept away from the cinematograph by the interposition of a flat spring.

In addition reference is had to the petitions of the parties.

The Tonbild-Syndikat A. G. entered as intervenor on behalf of the defendant. The defendant did not object to the admission of the intervenor. The intervenor took due note of the citations and statements of the defendant and adopted them as its own.

Reasons.

It is true that the plaintiff cited only a number of patent specifications before the expiration of the exclusion period, without adding further reasons, but as appears clearly from the figures of several patents, that flexible couplings

between two rotating parts are involved (compare for example British Patents 15,333 of 1912 and 166,321 as well as French Patent 492,564) the plaintiff has supplied provable material by the cited patents which closely approximate the subject matter of the patent under attack. This fact excludes the assumption, that the plaintiff was aware of the fact that the patents cited in the complaint could not support the nullity suit and that it only cited these patents for the sake of observing the five year period according to Section 28, paragraph 3 of the Patent Law. Thus the exclusion period was observed. The citation of further prior publications was permissible within the same reason of complaint.

From the patents cited by the plaintiff especially from British Patent 15,333 of 1912 and 166,321 as well as from French Patent 492,564 and U. S. Patent 1,255,143 it follows that it belonged to the state of the art, to provide elastic and particularly spring couplings when using rotating masses to eliminate irregularities of speed and that such couplings have already been used with phonographs which are used with the talking film. To use this arrangement for phonographs, as claimed in the main patent, cannot be considered as a patentable invention, as every worker in the art would naturally apply such a generally known coupling whenever the necessity of doing so arises.

For this reason the attacked patent of addition had to be declared null and void. The decision as to costs was determined by Section 31 of the Patent Law.

Patent Office.
Nullity Department.

(signed) Brisken, Richter, Habermann, Dr. Forch.
Dr. E. Schmidt
Recorded:
(sgnd) Ebel
Docket Clerk.

(seal)

ITEM IV.

German Nullity Decision *re* Photoelectric Cell.

In the Patent Litigation between:

Dr. S. Loewe Radio A. G. of Berlin-Steglitz,
Plaintiff,

versus

the Tri-Ergon Holding A. G. of St. Gallen,
Switzerland

Defendant,

with respect to the decision of partial nullity of Patent 417,967 the Government Patent Office, Nullity Department, in its session of September 10, 1931 in which there took part:

Chief Government Adviser as Chairman	Dr. Schon
and the Government Advisers	Dr. Paetzold, Habermann, Eales

after an oral hearing have decided:

Patent 417,967 is held to be partially null and void by striking out claim 1 of the patent.

The costs of the proceedings are assessed against the defendants.

Fact Situation.

The defendant is the owner of Patent 417,967 of class 42g, granted as of March 4th, 1919, entitled "An Arrangement for the Photographic Recording of Optical Acous-

tical Sequences and their Reproduction by means of a Constant Source of Light".

The publication on the grant of the patent took place on August 6th. 1925.

The plaintiff requests that Patent 417,967 be held null and void at least to the extent of patent claim 1 and that the costs of the proceeding be assessed against the defendant.

The prayer of the complaint was limited to claim 1 of the patent at the oral hearing.

Plaintiff bases its suit upon the ground that the subject matter of claim 1 no longer constituted a patentable invention in view of the state of the art.

Claim 1 of the attacked patent reads:

> "An arrangement for the photographic recording of optical acoustical sequences and their reproduction by means of a constant source of light, characterized in this, that in the recording the transverse illumination of the film strip is by means of the nature of a glowing gaseous path in an evacuated vessel, which responds without inertia to the sound frequencies, and that the constant source of light used in the reproduction actuates a photoelectric gaseous cell, for example, an alkaline metal cell."

In substantiation of the complaint filed by it on August 6th, 1930, the plaintiff alleges that by the use of a source of light in the nature of a glowing gaseous path in an evacuated vessel responding without inertia to the sound frequencies, in the sound recording and in a photoelectric gaseous cell in the sound reproduction distortions alone are eliminated but that there is not produced the effect of an important synchronism between the picture and the sound. There is thus no relation between the technical part relating to the picture and that relating to the sound and there is thus involved but the solution of a phonographic problem. That for the solution of this problem

it was necessary to employ means without distortion was known at the time of the application for the attacked patent, as is evidenced by French Patent 456,880. If in the subject matter of the first claim of the attacked patent a photoelectric gaseous cell is used for the sound reproduction, that constitutes no novelty of inventive importance inasmuch as such cells had become known *per se* by German Patent 296,016 and by the books of Ries, "Das Licht in seinen elektrischen und magnetischen Wirkungen" ("Light in its Electrical and Magnetic Effects"), 1909, page 141, and "Das Selen", ("Selenium"), pages 301 to 306.

That at the time of the application for Patent 417,967 it was known to use in addition to the equipment a recording equipment comprising a source of light responding to the sound frequencies without inertia is evidenced by British Patent 18,057 of 1906, as also by British Patents 10,526 of 1912, 16,941 of 1913, 105,589, and 107,025 as well as French Patents 448,757 and 459,537.

The defendant requests that the complaint be dismissed with costs. Defendant alleges:

The invention according to the attacked patent claim is a combination invention. It relates to a recording and reproducing equipment for sound and picture and not to one solely for sound. At its basis is the problem to reproduce the sound in all its parts simultaneously with the picture. For the solution of this problem there are means necessary for the recording method as also for the reproducing method which, as a result of their freedom from inertia, avoid every appearance of distortion. In British Patent 18,057 of 1906 inertialessly operating equipment is used neither for the recording nor for the reproduction. German Patent 296,016 does show a photoelectric gas cell, its use as a reproducing means in sound picture performances is neither described nor intimated. So also the arrangement of British Patent 16,941 of 1913, 10,526 of 1912, 105,589, and 107,025, as well as French Patents

448,757, 456,880, and 459,537, did not use means for the recording and reproduction by which the problem could be solved.

The problem constituting the basis of the attacked patent is novel and the solution of this problem in the manner designated in the claim has inventive importance.

Reference is had to the pleadings of the parties. At the oral hearing the complaint was combined, for the purpose of simultaneous hearing with nullity complaint Ni II.b.145.30 with the consent of the parties (Section 1345 of the Civil Code).

Reasons for the Decision.

The attacked patent claim discloses the teaching that in the photographic recording of optical acoustical sequences the transverse illumination of the film strip occurs by means of a light source responding to the sound frequencies without inertia and shaped in the nature of a glowing gaseous path in an evacuated vessel, and permitting the constant light source which is generally used in the reproduction of the photographic record to actuate a photoelectric gaseous cell, for example, an alkaline metal cell.

Controlling with respect to the selection made of the means for the sound recording and reproduction, as is disclosed in the specification, are considerations of their freedom from inertia, their freedom from distortion and disturbances, and, in the case of the source of light for the recording, the freedom from its own noises. Means having such properties are said, in the introduction of the specification, (first paragraph) to be appropriate for solving the problem for recording and reproducing the acoustical sequences synchronously with the optical events.

That this problem was not new at the time of the application for Patent 417,967 is admitted in the introduction of the patent specification and is evidenced by British

Patent 18,057 of 1906, in which (on page 1) the necessity of an exact synchronism between the picture and the sound in the recording and reproduction is named as the first requirement for producing excellent sound picture productions. It is also emphasized in the British patent that no changes in the original sound waves may be caused by the sound recording and sound reproducing means. But that means nothing other than the requirement set forth in German Patent 417,967 that means free of distortion be used which do not cause any noises themselves. Thus the problem constituting the basis of claim 1 of Patent 417,967 was clearly known.

The defendant alleges that the object of the invention was not the production of a synchronism in the ordinary sense as was the case of the British patent, but that with the subject matter of the first claim a synchronism between picture and sound in the narrower sense is to be obtained in which a sound in all its details (harmonics) is made audible exactly at the same time as the picture. We need not dwell on the fact that these effects are not discussed in the original documents or actually obtained with the means set forth, in spite of the defendant's allegations to the contrary. There is certainly no need for such synchronism. The anatomical structure of the human ear has the effect that all vibrations of a sound may simultaneously be grasped and that time displacements of the individual sound waves of the order of magnitude possible in this connection has no effect upon the audition of the sound.

In as much as therefore the production of a synchronism between sound and picture in the usual sense and the undistorted reproduction of the original sounds can be held to be the problem constituting the subject matter of the attacked patent claim, and inasmuch as this problem was made known in its entirety by British Patent 18,057 of 1906, we have but to decide whether the means used for the solution of this problem in the attacked claim are sufficiently important to support a patent.

To solve the known problem claim 1 of Patent 417,967 employs in its broadest aspect the same means as used in the arrangement of British Patent 18,057 of 1906. An alternative specific embodiment shows only the means for illuminating the film strip and responding to the sound frequencies and the means for converting the light variations into electrical oscillations for use in sound reproduction. Both means were known at the time of the application for Patent 417,967, as is admitted in the patent specification. When by the use of the means with their known properties, nothing else is accomplished, than a further improvement of the effect intended with the equipment of British Patent 18,057 of 1906 such progress can be considered only as one arising from the further development of the art which does not justify the grant of a patent.

The attacked patent claim characterises an equipment for the photographic recording of optical acoustical sequences and their reproduction by means of constant light sources in which, in the recording, the transverse illumination of the film strip takes place by means of a source of light responding without inertia to the sound frequencies in the nature of a glowing gaseous path in an evacuated vessel and that in the reproduction the constant light source employed actuates a photoelectric gaseous cell, for example, an alkaline metal cell. The claim thus prescribes certain arrangements which in particular are to be used in the recording and in particular in the reproduction. For the recording of optical acoustical sequences entirely different equipment is employed than in the reproduction. Thus the suggestions contained in the patent claim are not directed to the improvement of an arrangement for the recording and reproduction of optical acoustical sequences, but to equipment for recording and to an equipment for the reproduction of optical acoustical sequences. The two equipments are spatially entirely

independent of each other to enable their use at entirely different places as is required in their use. Their use is always at different times. The grouping of the suggestions to improve both equipments in a single claim is therefore not justified and it is also not justified in that the two equipments proposed serve a single purpose, that of producing a synchronism between picture and sound and a distortionless reproduction of the original sound. We cannot thus hold that the attacked claim constitutes a combination in the sense of the combined use of several means to bring about a unitary technical effect.

In view of this we must now investigate as to whether on the one hand, the improvements suggested for the recording equipment and on the other hand, that for the reproducing equipment, constitute patentable inventions.

Synchronism between sound and picture is produced in British Patent 18,057 of 1906 essentially by the simultaneous recording of sound and picture upon the same strip of film, a means which is also employed in the attacked patent.

To prevent changes in the sound wave when using phonographs for the recording of sound, British Patent 18,057 of 1906 proposed means which were available to the art at that time for the recording of sound in which there is no immediate contact between the element responding to the sound vibrations and the body upon which the record is made. If by this means an improvement of the sound record and the desired object is effected to a certain extent, it nevertheless developed that the desired perfection of the sound reproduction could not be effected. It was therefore obvious to look around for other means for the recording of the sound than those described in British Patent 18,057 of 1906, but E. Gehrke in Zeitschrift for the Jastrumentenkunde 1905 at page 33 and at page 278 described an oscillator whose effect was based upon the glow light produced at the cathode in rarefied gases and

which was to be primarily used for the recording of the current fluctuations in high potential alternating currents and vibrations. To use such an oscillator for the reproduction of acoustical vibrations is suggested on page 280 (last paragraph) of said publication. To follow this suggestion and to use the glow light oscillator in place of the recording means disclosed in British Patent 18,057 of 1906 required in inventive activity, all the less inasmuch as the conditions laid down for this recording means, are made thereby, and the reference to oscillators as appropriate recording means renders their use obvious.

Such a glow light oscillator is a source of light in the nature of a gaseous path in an evacuated vessel. That this source of light responds without inertia to the impressed vibrations is a property which is repeatedly emphasized in the Gehrke publication. That it is without distortion and does not cause noises of its own is apparent without anything further and was not disputed by the defendants. Insofar as the attacked patent relates to recording equipment therefore it does not characterize a patentable invention.

For the reproduction of acoustical phenomena, British Patent 18,057 of 1906 uses a selenium cell. That such a cell does not instantaneously respond to the light variations and that it is therefore not appropriate for the conversion of rapidly changing light intensities was long common knowledge to the art at the time of the application. When, therefore, a different photo-electric cell, an alkaline metal cell, and its advantage of freedom from inertia, was discovered, this was soon introduced in the art (see German Patent 296,016) and used in place of selenium cells. In French Patent 456,880 (page 2 lines 62 to 65) such use of the alkaline metal cell for sound reproduction equipments was suggested, in other words, the same arrangement in which it is used in accordance with the attacked claim of Patent 417,967. Inasmuch as the

simultaneous reproduction of optical and acoustical sequences recorded upon the same strip of film was known by British Patent 18,057 of 1906 it was obvious to use the improved means of sound reproduction in such arrangements. If, therefore, an advantage is secured, it resides only in the improvement of the synchronism and the sound reproduction, an object which was pointed out by British Patent 18,057 of 1906. So also the reproduction equipment suggested in claim 1 of Patent 417,967 cannot, therefore, constitute an invention.

The patent, therefore, without necessitating a consideration of the other publications cited by the plainiff, was therefore to be held partially void in accordance with the prayer of the plaintiff in that patent claim 1 is cancelled.

The costs of the proceedings in accordance with Section 31 of the Patent Law, had to be assessed against the defendants.

(Sgd.) Government Patent Office,
Nullity Department.

Dr. Schon. Dr. Busse. Eales. Habermann. Dr. Paetzold.

A True Copy.
Signature.
Office Employee.

RÉPUBLIQUE FRANÇAISE.

OFFICE NATIONAL DE LA PROPRIÉTÉ INDUSTRIELLE.

BREVET D'INVENTION.

U. S. PATENT LIBRARY APR 27 1914 PATENT OFFICE

XII. — Instruments de précision, électricité. N° 456.880

2. — Appareils de physique et de chimie, optique, acoustique.

Procédé photo-électrique de reproduction des sons.

M. Raoul Maurice GABRIE, résidant en Espagne.

Demandé le 28 juin 1912.
Délivré le 30 juin 1913. — Publié le 6 septembre 1913.

[Brevet d'invention dont la délivrance a été ajournée en exécution de l'art. 11 § 7 de la loi du 5 juillet 1844 modifiée par la loi du 7 avril 1902.]

Le procédé suivant l'invention est une application de la radiotéléphonie, c'est-à-dire du photophone inventé par Graham Bell; il a pour but l'enregistrement et la répétition des sons, au moyen d'un ensemble d'appareil qui constitue un phonographe photo-électrique.

Dans la radiotéléphonie qui a seulement pour objet la transmission à distance des sons et, en particulier, de la parole, on utilise celle-ci pour produire, au moyen d'un dispositif approprié, des variations d'intensité d'une source lumineuse; cette source devient alors le siège de vibrations qui correspondent à celles de la parole.

Au moyen d'un système optique ou d'une simple lentille, on reçoit sur une pile au sélénium l'image de la source lumineuse influencée par la parole. On sait que le sélénium cristallisé possède la propriété d'être plus ou moins bon conducteur de l'électricité suivant qu'il est plus ou moins éclairé, le rapport des conductibilités dans les deux cas étant de 50 à 1 environ. Si donc la pile au sélénium est montée en série avec une batterie de piles électriques et un récepteur téléphonique, les variations d'éclairement du sélénium produisent dans le circuit des variations d'intensité du courant, et l'on entend dans le récepteur téléphonique les paroles qui ont influencé la source lumineuse.

Ceci posé, pour obtenir l'enregistrement des sons, il suffit d'enregistrer les variations d'intensité de la source lumineuse. Soit donc une source lumineuse influencée par les sons à enregistrer (parole, sons musicaux, etc.); cette source lumineuse est le siège de vibrations qui correspondent à celles des sons émis. Pour enregistrer ces vibrations, il suffit de prendre de la source lumineuse considérée une suite de vues cinématographiques. Si même cette source est de forme longue et étroite, il suffira de la photographier sur une bande sensible se déroulant d'une manière continue, le mouvement de translation de cette bande étant perpendiculaire à la plus grande dimension de la source lumineuse envisagée.

Pour obtenir ensuite la reproduction du son ainsi enregistré, on traitera la bande de pellicule sensible par les procédés photographiques ordinaires et on en tirera une épreuve positive que l'on projettera sur une pile au sélénium disposée comme il a été dit plus haut. Si l'on a pris une vue cinématographique de la source lumineuse, il faudra faire une projection cinématographique, les images se succédant naturellement dans le même

FRENCH REPUBLIC

FRENCH TRADEMARK AND PATENT OFFICE

PATENT OF INVENTION

XII.—Instruments of Precision—Electricity #456,880
2.—Apparatus for physics and chemistry, optics, acoustics.

Photo-electric process for the reproduction of sounds.
Mr. Raoul Maurice Gabbie, residing in Spain.

Patent applied for on June 28, 1912.
Issued on June 30, 1913—Published on September 6, 1913.

(Patent of invention the issuance of which was postponed in execution of the provisions of art. 11 sub-section 7 of the law of July 5, 1844 amended by the law of April 7, 1902)

The process which is the subject matter of this invention is an application of radiotelephony, *i. e.:* of the photophone invented by Graham Bell. It has for its object the recording and the reproduction of sounds, by means of an apparatus assembly constituting a photo-electric phonograph.

In radiotelephony, the object of which is merely the transmission at a distance of sounds and, especially, of speech, the latter is used for the production, by means of a suitable device, of variations of the intensity of a source of light; this source becomes then the seat of vibrations corresponding to the speech vibrations.

By means of an optical system or of a simple lens, the image of the source or light, influenced by speech, is received on a selenium cell. It is known that crystallized selenium has the property of being of a greater or lesser conductivity according to whether it is more or less illuminated, the conductivity ratio being in both cases about 50 to 1. Consequently, if the selenium cell is mounted in series with a battery of electric cells and a telephone receiver, the variations of illumination of the selenium will produce some variations of current intensity in the circuit, and the speech which has influenced the source of light will be heard in the telephone receiver.

This being the case, in order to obtain the recording of the sounds, it will suffice to record the variations of intensity of the source of light. Let us therefore examine a source of light influenced by the sounds to be recorded (speech, musical sounds, etc.); this source of light is the seat of vibrations corresponding to those of the sounds transmitted. In order to record these vibrations, it will suffice to make a series of motion picture images of the source of light in question. Even if this source is of an elongated and narrow shape, it will suffice to photograph same on a sensitive film which unfolds in a continuous motion, the translation motion of this film being perpendicular with respect to the largest dimension of the source of light.

In order afterwards to reproduce the sounds thus recorded, the film in question will have to be treated by the customary photographic processes and a positive will have to be made of same, which positive will be projected on a selenium cell arranged as above mentioned. If a motion picture view of the source of light has been made, then it will be necessary to make a motion picture projection, with the various images following each other in the same order of sequence as when the images were made. If the photograph taken has been continuous, then the projection will also have to be continuous and the projection apparatus

will have to be arranged in such a manner as to project, at any moment, only the part of the film which about corresponds to the image which would be made by the source of light on the sensitive film at rest.

(light)

In any event, as the auditory impressions, like the optic impressions, last 1/10 of a second, it will suffice to record and project more than ten images per second in order for the impression made on the ear to be continuous and in order for the sounds originally transmitted to be heard in the telephone receiver.

When the recording and the projection are made like a motion picture, there will be also heard the sound which corresponds to the number of obturations per second of the projection apparatus; it is however possible to obtain a telephone plate which cannot reproduce this sound and thus avoid that such sound be superimposed on the sounds which it is desired to reproduce.

It may be useful, as has already been mentioned, to make a positive proof of the plate obtained, but this is not essential. As a matter of fact, should the conductivity of the selenium vary in inverse proportion with the illumination instead of varying in direct proportion with it, the effect thus produced would still be of the same kind.

Therefore, the photo-electric phonograph consists of the four following separate parts or members:

1. One transmitter for the transformation of acoustic vibrations into light vibrations.

2. One recorder for the recording of the light vibrations.

3. One projector for the projection on the receiver of the images given by the recorder.

4. One receiver for the transformation of the light vibrations into electric vibrations, which are finally transformed into acoustic or sound vibrations by means of a telephone receiver.

Any of the transmitters used in radiotelephony may be used as transmitter: Graham Bell's reflection transmitter, manometric flames, talking electric arc, etc. In the latter case, the sounds are transmitted in front of a microphone mounted in shunt with an electric arc lamp on a D. C. circuit; the arc which is very sensitive vibrates and repeats the sounds transmitted.

The recorder is a motion picture camera or an ordinary camera in which the image forms on a film band which is sensitive and unfolds in a uniform motion.

The projector used may also be either a motion picture projector or a continuous projector.

Finally, the receiver may be any body whatever having photo-electric properties, a potassium photo-electric cell for instance or a cell made with any other metal having the same property. At present, however, the best receiver known is that which is known under the name of selenium cell.

CLAIMS

This invention concerns:

1. A photo-electric reproduction process for the reproduction of sounds, which process is characterized by the fact that there are recorded on a photographic film, either as motion picture images or as continuous images, variations of intensity of the source of light of a photophonic transmitter and also characterized in the fact that the positive or negative image film is projected on a substance, having photo-electric properties, of the circuit of the photophonic receiver.

2. As an industrial product, any photographic film carrying a motion picture image or a continuous image, whether positive or negative, of the variations of the light intensity produced by sounds.

RAOUL MAURICE GABRIE
by: CH. DONY
Agent